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ABSTRACT

The purpose of this study is to investigate facilitation in an online learning environment. The types of facilitation are examined using distance course students as subjects. Students' characteristics such as prior experience in distance courses, demographic attributes such as age, gender, and grades are incorporated as variables to explore their relationships with facilitation. This study first identifies major types of online facilitation that students requested in a Web-based course. It then inspects whether students with different characteristics requested different types of online facilitation. Finally, the study examines whether the amount of messages requesting online facilitations is associated with learning achievement. Participants were 29 college students in a Web-based course at a state university. The course requires students to actively participate in online activities and all course assignments are submitted as electronic files via the course site. Research data were the threaded messages that were posted by students, the instructor, and the TA in the designated areas in the course site. Threaded messages posted through entire semester were collected. Five types of online facilitation were identified. Findings and implications of findings regarding the relationships among types of online facilitation, student characteristics, and learning achievement are discussed. It was found that students requested more facilitation in assignments and grade criteria, and in network access. Different student characteristics were found to prefer different types of facilitation. Implications of this study for Web-based course design and teaching was then suggested. (Author)

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What Types of Online Facilitation Do Students Need?

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Abstract

The purpose of this study is to investigate facilitation in an online learning environment. The types of facilitation are examined using distance course students as subjects. Students' characteristics such as prior experience in distance courses, demographic attributes such as age, gender, and grades are incorporated as variables to explore their relationships with facilitation. This study first identifies major types of online facilitation that students requested in a web-based course. Then this study inspects whether students with different characteristics requested different types of online facilitation. Finally this study examines whether the amount of message requesting online facilitation is associated with learning achievement.

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Five types of online facilitation were identified in this study. Findings and implications of findings regarding the relationships among types of online facilitation, student characteristics, and learning achievement were discussed. It was found that students requested more facilitation in assignments and grade criteria, and in network access. Different student characteristics were found to prefer different types of facilitation. Implication of this study for web-based course design and teaching was then suggested.

Introduction

As more college courses are placed online, effective instruction tools of online courses has become one of key issues of investigation. Among the instruction tools adopted in online courses, facilitation is a variable less studied. The purpose of this study is to explore facilitation as an effective instruction tool and examine the relationships among types of online facilitation, student characteristics, and learning achievement. Students taking online courses tend to learn alone in front of their computers and are distant from their instructors or classmates both physically and psychologically. Therefore, they need assistance in solving problems such as accessing to course materials in course site or in clarifying expectations of assignments online. The instructor or student peers may respond to a student's request so the student can learn to get what he needs online. Therefore, facilitation is even a more important factor in scaffolding learning in web-based environments as compared to the traditional classrooms. However, very few existing studies have looked into the nature of facilitation in online learning environments. This has presented a research opportunity for this study to explore types of facilitation and variables affecting facilitation.

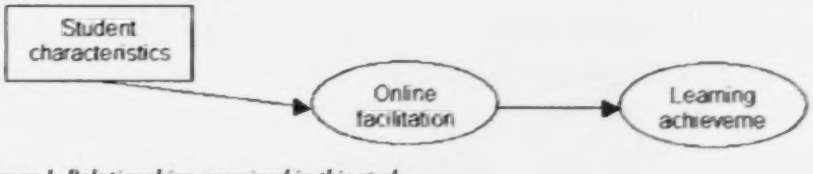

Figure 1. Relationships examined in this study

The findings of the study will provide new insight into designing and teaching web-based courses. Specifically, the study identifies types of online facilitation and suggests that both web-based course designers and instructors should pay more attention to some particular types of facilitation that students requested more often. The findings also suggest that different students may require different amount of facilitation.

Literature Review

Online Facilitation

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In online learning environments, on-line facilitation has been proposed in previous studies as an effective pedagogical strategy to increase interaction and, then, to enhance learning achievement. Althaus (1997) studied the effects of computer-mediated discussion (CMD) on learning achievement. He recommended providing facilitation in order to encourage students to participate in CMD, especially those students who lacked online skills. Hmelo, Guzdial, and Turns (1998) investigated the effect of an online forum for collaboration and reflection in the Collaborative and Multimedia Interactive Learning Environment (CaMILE). The authors suggested that some forms of online facilitation were needed either to provide a logical connection between student activities and conceptual topics or to provide the concrete referent that was needed for reflective discussion. Furthermore, Garland (1993) inspected students' perceptions of barriers in completing distance courses. To overcome these barriers, she recommended providing adequate facilitation to students in terms of more communication. Although online facilitation has been suggested as an effective pedagogical strategy by many researchers, it is unclear that whether online facilitation is equally effective in different student demography.

Student Characteristics

Student characteristics have been predicted to have impact on learning outcomes. Major student characteristics investigated in computer-aided or online learning environments are prior experience in similar learning environments, personal attributes, and learning achievement. As to prior experience, previous studies suggest that prior experiences in using computer are positively related to academic achievement. Althaus (1997) found that students who had more e-mail experience were more willing to participate in Computer-Mediated Discussion (CMD), and students who fully participated in CMD performed better than others who participated less. Grantham and Vaske (1985) found that the amount of prior experience in e-mail was positively associated with telecomputing use. Hiltz (1993) concluded that students' comfortableness with computers was one of the major characteristics that would lead to better learning in computer-aided environments. Also, Harris and Grandgenett (1996) found that telecomputing experience was positively related to greater online time, and greater online time could lead to higher achievement.

The consistent positive association between prior experience in using computer and more efforts on online learning may imply that students who have no experience in distance learning may need more facilitation to assist them. But, there are few studies examining the relationship between the need for facilitation and prior experience.

Regarding student's personal attributes such as gender and age, there is little research that studies how personal attributes affect the need for facilitation. Previous studies, investigating learner characteristics and computer anxiety in computer-aided learning environments, suggest that such a link may exist. High computer anxiety students may need more facilitation to reduce anxiety level. However, previous studies on computer anxiety showed inconclusive results concerning the relationship between personal attributes and computer anxiety.

A meta-analysis of 81 studies reported that computer anxiety was not significantly correlated with gender and age (Rosen & Maguire, 1990). But, another study reported that feminine-identity students showed higher anxiety than masculine-identity students did (Rosen & Sears, 1987). Other studies also reported significant correlation between computer anxiety and age. In one study it was reported that older adults (55 years old and over) appeared to have less computer anxiety than younger adults (30 years old and under) did (Dyck & Smither, 1994). However, in other studies it was reported that older students were more computer anxious than younger students (Rosen, Sears, & Weil, 1987; Jones & Wall, 1989). Five studies of over 450 college students compared the computer anxiety of computer and business major students with that of other major students and found that computer anxiety consistently correlated with students' majors (Rosen, Sears, & Weil, 1987).

Learning Achievement

While previous studies addressed very little about the relationship between online facilitation and learning achievement, some studies examining the relationship between computer anxiety and learning achievement. A study explored components of computer anxiety and found there was no significant relationship between anxiety and students' academic achievement in the computer course as measured by their course grades (Jones & Wall, 1989). Although computer anxiety may be viewed as an indicator to the need for online facilitation, it is hard to draw any conclusion without more studies. Thus, this study is devoted to investigating the relationship between learning achievement and online facilitation.

Method

Participants

The participants of this study were 29 college students, 21 females and 8 males, who enrolled in a web-based course at a state university. 14 participants majored in Open Distance Learning and 15 participants in other degree programs. Participants' ages are 19 and above. All 29 participants were voluntarily participated in this study.

The Course

This study was conducted in a course that was entirely delivered via a web-based course site. The course title was Learning Theories and Cognition in Instruction and was offered by the College of Education at a state university in the southeast of the United States. Students were required to submit all assignments electronically via the course site. Also online participation in activities was mandatory. The final course grade consisted of four assignments (60%) and online participation (40%).

Three designated areas in the course s ite were created for students to post requests for facilitation. These areas were Online Office, Student Lounge, and Information Sharing (Figure 2). Students were encouraged to post messages in these areas for asking extra assistance, raising questions, expressing concerns, and sharing information with the class. The instructor, the teaching assistant (TA), and students might respond to messages in these areas. Also, the instructor and the TA might also respond in the Announcements area in the course site (Figure 3).

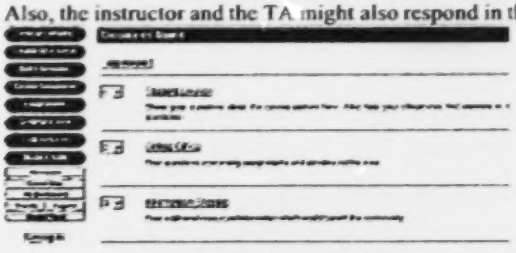

Figure 2. Online Facilitation Areas

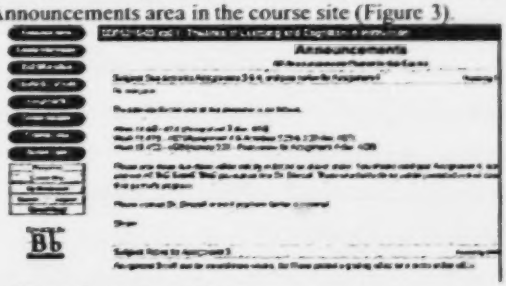

Figure 3. Announcements

Data collection and Analysis

Research data were the threaded messages that posted by students, the instructor, and the TA in the Online Office, Student Lounge, Information Sharing, and Announcements areas in the course site. These data were collected through an entire semester. In the beginning of the semester, a survey, which collected the information of students' demography, personal particulars, and prior experience in distance courses, was filled by participants.

First, based on the senders of messages, messages were classified into two categories: requesting for facilitation and responding to requests. Then, based on the content of questions or responses in the message texts, these messages were further classified into different facilitation types within each category. Total frequencies of requesting facilitation and responding to requests were tallied. Finally, cross tables of facilitation type, student characteristics, and learning achievement were generated.

Results

Types of Online Facilitation

Five types of online facilitation were identified from the content analysis of the threaded messages as posted by students in the course site. The total number of request messages, which requested for facilitation, was 33. These five facilitation types with descriptions are listed in the following:

1. Assignments and grades: Messages that asked questions about due dates, the instructor's expectation, grading criteria of assignments, and course grades
2. Network access: Messages that asked questions about the access to WWW network and online course materials in the course site
3. Online discussion: Messages that asked questions about clarification, reflections, and suggestions of online discussion
4. Group activities: Messages that asked questions about group activities

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5. Other course materials access: Messages that asked questions about the access to the textbook, study guide, the university, and local libraries

The results indicated that the most requested type of facilitation was Assignments and grades, which included 13 messages and represented 39% of total messages that asked for facilitation. The second most requested type of facilitation was Network access, which included 11 messages representing 23% of total messages that asked for facilitation. See Table 1 for the frequency of messages that requested online facilitation in each facilitation type.

There were 85 response messages that responded to the request messages. Based on the persons who responded, the messages were sorted into three categories: instructor, TA, and peer. Peer responses were the highest responses in all five facilitation types. Peers responded 54 messages, which consisted of 64% of total responded messages. The instructor and TA responded 16 and 15 messages and consisted of 19% and 18% of total response messages, respectively. See Table 1 for the frequencies of response messages from the instructor, TA, and peer in each facilitation type.

Student Characteristics and Online Facilitation

Experience in distance courses. There were 33 request messages posted by 24 experienced students and 0 messages posted by 5 non-experienced students. The average number of messages was 1.38 per experienced student and 0.00 per non-experienced student.

Table 1. Types of facilitation that students need in a web-based course

Facilitation Type	Frequency**	Responded by***			Total Responses
		Instructor	TA	Peer	
Assignments & grades *	13* (39%)	10 (25%)	8 (20%)	22 (55%)	40
Network access*	11* (33%)	0 (0%)	2 (7%)	26 (93%)	28
Online discussion	5 (15%)	5 (50%)	2 (20%)	3 (30%)	10
Group activities	3 (9%)	1 (17%)	3 (40%)	2 (33%)	6
Other course materials access	1 (3%)	0 (0%)	0 (0%)	1 (100%)	1
Total	33	16 (19%)	15 (18%)	54 (64%)	85

*The most needed two types of facilitation **Percentage of total frequency***Percentage of total responses

Gender. Among the 33 messages requesting for facilitation, 27 messages were posted by 21 females and 6 messages were posted by 8 males. The average number of messages was 1.29 per female and 0.75 per male.

Age. There were 13 messages posted by 17 younger students (age 19 – 35 years) and 20 messages posted by 12 older students (age 36 and above). The average number of messages was 0.76 per younger student and 1.66 per older student.

Major. There were 29 messages posted by 14 students of Open Distance Learning major and 4 messages posted by students of other majors. The average number of messages was 2.07 per student of Open Distance Learning major and 0.27 per student of other majors.

GPA. In order to have similar number of students in each cluster, GPA was classified into three clusters: low GPA (3.0-3.69), medium GPA (3.70-3.99), High GPA (4.00). There were 16 messages posted by 11 high GPA (4.00) students, 17 messages posted by 9 medium GPA (3.70-3.99) students, and 0 messages posted by 8 low GPA (3.00-3.69) students. The average number of messages was 1.45 per high GPA student, 1.89 per medium GPA student, and 0.00 messages per low GPA student. Table 2 lists the amount and average of messages that requested facilitation under each student's characteristic.

Table 2. Student Characteristics and Online Facilitation

Student Characteristic		Total number of students	Total frequency of requesting facilitation	Average Frequency per student
Experience in distance courses	No	5	0	0.00
	Yes	24	33	1.38
Gender	Female	21	27	1.29
	Male	8	6	0.75
Age	Younger (age 19-35)	17	13	0.76
	Older (age 36 and above)	12	20	1.70

Major	Open Distance Learning	14	29	2.07
	Other majors	15	4	0.27
GPA*	Low (3.0-3.69)	8	0	0.00
	Medium (3.70-3.99)	9	17	1.89
	High (4.00)	11	16	1.45

*There is one datum missing in GPA.

The Most Needed Facilitation Type within Each Student Characteristic

The most requested facilitation type within each student characteristic was analyzed. Overall, the results showed consistently that the most requested types of facilitation were: 1) Network access, 2) Assignments and grades. However, further observation reveals that the most requested facilitation may differ in different student characteristics. It can be observed that students with prior distance learning experience needed facilitation in assignments and grades the most, while non-experienced students desired facilitation in network access the most. The most needed facilitation for female students was assignments and grades, whereas for male students was network access. While younger students (years 19 – 35) needed facilitation in assignments and grades the most, older students (years 36 and above) requested facilitation in network access the most. Open Distance Learning majors needed facilitation in network access the most, and other major students desired facilitation in assignments and grades the most. Both high and medium GPA students needed facilitation in network access the most. However, low GPA students did not request any facilitation. See Table 3 for the most needed type of facilitation in each learner characteristic.

Table 3. The Most Needed Facilitation Type by Student Characteristic

Student Characteristic		Facilitation Type
Experience in distance learning	No	Assignments & grades
	Yes	Network access
Gender	Female	Assignments & grades
	Male	Network access
Age	19-35	Assignments & grades
	36 and above	Network access
Major	ODL	Network access
	Other majors	Assignments & grades
GPA	Low (3.00-3.69)	None
	Medium (3.70-3.99)	Network access
	High (4.00)	Network access

Learning Achievement and Online

The final course grade was categorized into three clusters: low grade (2.19-3.46), medium grade (3.47-3.82), and high grade (3.83-4.00) with each cluster having similar number of students.. The total number and the average of the messages that requested facilitation in each cluster of the final course grade are listed in Table 4. Table 4 shows that low-grade and high-grade students posted an average of 1 message per person while medium grade students posted an average of 1.4 messages per person.

Table 4. Learning Achievement and the Amount of Online Facilitation

Final Course Grade	Low (2.19-3.46)	Medium (3.47-3.82)	High (3.83-4.00)
Total number of students	10	10	9
Frequency of requesting facilitation	10	14	9
Average Frequency per student	1.00	1.40	1.00

The average of request online facilitation, then, was calculated under each student characteristic within each cluster of the final course grade. The results showed 0 message posted by non-experienced students in all grade clusters. The result also showed similar averages of messages posted by experienced students in all grade clusters, 1.25, 1.56 and 1.29 messages per experienced student for low, medium, and high-grade students, respectively. For female students, medium-grade students posted the most (1.43) messages per student; and for male students, the

high-grade students posted the most (1.50) messages per student. For younger students, high-grade students posted the most (1.50) messages per student; and for older students, medium-grade students posted the most (2.00) messages per student. For Open Distance Learning students, medium-grade students posted the most (3.25) messages per student; and for other major students; low-grade students posted the most (1.67) messages per student. The results showed 0 message posted by low GPA students in all grade clusters. For medium GPA students, low-grade students posted the most (3.33) messages; and for high GPA students, medium-grade students posted the most (2.00) messages.

Overall, The result showed that among experienced, female, older, Open Distance Learning major, and high GPA students, medium-grade students requested more facilitation than either low or high-grade students. The result also showed that among other majors and medium GPA students, low-grade students requested more facilitation than either medium or high-grade students. In addition, the result showed that among male and younger students, high-grade students requested more facilitation than either low or medium-grade students. Table 5 lists the average of request online facilitation by student characteristics within final course grade clusters.

Table 5. The Average of Request Online Facilitation by Student Characteristics within Grade Clusters

Student Characteristic \ Request Facilitation \ Final Course Grade		Low (2.19-3.46)	Medium (3.47-3.82)	High (3.83-4.00)
DL Experience	No	0	0	0
	Yes	1.25	1.56	1.29
Gender	Female	1.14	1.43	.0.86
	Male	0.67	1.33	1.50
Age	Younger (19-35)	1.14	1	1.50
	Older (36 and above)	0.67	2.00	0.60
Major	Open Distance Learning	0	3.25	1
	Other majors	1.67	0.17	1.00
GPA	Low (3.0-3.69)	0	0	0
	Medium (3.70-3.99)	3.33	1.33	1
	High (4.00)	0.00	2.00	1.20

*DL experience: experience in distance learning

Discussion

Types of Online Facilitation

Five types of online facilitation were identified. They were, in the order of descending frequency of request: 1) Assignments and grades 2) Network access 3) Online discussion 4) Group activities 5) Other course materials access. This result suggests that from students' viewpoints the most desired facilitation is assisting them to complete the assignments and to obtain high grades. The second most needed facilitation is the assistance in network access to course materials and participating in the activities in the course site.

This finding of assignments and grades as the most needed type of facilitation shows strong implications in web-based course design and teaching. For web-based course design, instructional system designers should make the description of assignments and grading criteria particularly clear so that it can thoroughly communicate with students about the expectations of the course. For web-based course teaching, although the descriptions of assignments and grading criteria may be clearly stated in the course site, students may overlook them. Instructors should instruct students to the location of specific pages or even demonstrate to students how to access to this particular information containing assignments and grading criteria in the course site.

The implication of this finding concerning network access as the second most requested type of facilitation is that both web-based course designers and instructors should take students' computer literacy into consideration while designing and teaching web-based courses. Although telecommunication technology is very promising most of the time, it seems also very discouraging sometimes. Network disconnection occurs irregularly if not frequently in everyday practice. There are so many factors that may affect the network connection and, consequently, may cause communication barriers between students and instructors. Some of these problems may not be controllable or fixable by students. Flexibility of schedule should be built within web-based course design. Due dates of

assignments and activities should not be too rigid in order to allow time for solving unexpected telecommunication problems. Instructors should seek prompt support from the system support team, who is responsible for the course delivery system, so that any telecommunication problems can be solved as soon as possible.

Response Messages

About two thirds (64%)of the total response messages was posted by students, while the instructor together with the TA provided about one third (37%). This finding implied that peers contribute a great deal of facilitation. The willingness of providing help among peers in this web-based learning environment appears to be strong. This result suggests that interaction among students plays an important role in distance learning environments. Peer interaction should be included as an essential instructional strategy in web-based course design. Web-based course instructors should build rich learning communities in course sites and encourage students to actively provide facilitation to peers.

Student Characteristics and Online Facilitation

The most important finding from this study was that all 33 messages that request for online facilitation were posted by experienced distance students. In contrast, no message was posted by non-experienced distance students. The reason why this result produces such a strong contrast may be because experienced students know how to request online facilitation whereas non-experienced students may not know. Although it is speculated that non-experienced students may need and request more facilitation than experienced students do, the data seem not able to support such a speculation. The data can only be explained by the fact that non-experienced students have problem learning to use online communication tools to express their needs for online facilitation. The online tools of communicating via the course site are new to non-experienced students and they may be less comfortable in using these new tools.

Although this finding indirectly supports previous findings that experienced students spend more time online than non-experienced students do (Vaske, 1985; Hiltz, 1993; Grandgenett, 1996; Althaus, 1997), the hypothesis that non-experienced students will request more online facilitation was not supported in this study. How to reveal the need for online facilitation from non-experienced student will be an important research challenge in the future.

The average frequency of requesting facilitation is higher in females (1.29 per female) than in males (0.75 per male). If requesting for facilitation is an indication of anxiety, this finding indirectly supports previous studies that feminine-identity students were found to appear more computer anxious than masculine-identity students do (Rosen & Sears, 1987). Given that existing studies involving gender effects in computer-related learning have produced inconsistent findings, this finding of significant gender effects should be considered as tentative. Further research in examining the relationship between learner's gender and the need for online facilitation is still needed.

The average number of messages posted by older students (1.70 per student) to request for online facilitation was higher than those posted by younger students (0.76 per student). This finding supports some studies that older students are found to be more computer anxious than younger students (Rosen, Sears, & Weil, 1987; Jones & Wall, 1989).

The average number of messages posted by Open Distance Learning major students (2.07 per student) was higher than other major students (0.27 per student). This finding indirectly supports a previous result that computer anxiety consistently correlated with students' majors (Rosen, Sears, & Weil, 1987). Once again that further research is desired for directly addressing the relationship between student's major and the need of online facilitation.

The average number of messages that requesting online facilitation posted by high and medium GPA students (1.45 per high GPA student, 1.89 per medium GPA student) were higher than low GPA students (0.00 per low GPA students). Low GPA students did not even request any online facilitation at all. They seem either not know how to request facilitation or have low learner motivation to solve problems that are pointed out in the online messages. This finding may suggest that the learner motivational factors should be built in both web-based course design and teaching. If the web-based course design can gain and sustain students' attention to the focus of the course contents, enhance relevance between course contents and the learners' concerns, build students' confidence about themselves, and generate students' satisfaction about the course, students may be more motivated to solve problems and to request necessary facilitation.

The Most Needed Facilitation Type wi thin Each Student Characteristic

The finding indicated, for each student characteristic, the most desired facilitation type was either network access or information of assignments and grades. Further data analysis reveals that, on one hand, female, younger, other majors, non-experienced, and medium and high GPA students requested facilitation in assignments and grades the most. On the other hand, male, older, Open Distance Major, and distance learning experienced students needed facilitation in network access the most. Female, younger, other majors, non-experienced, and medium and high GPA students may be less sure about their learning achievement, so they are more concerned about assignments and grades. On the contrary, male, older, Open Distance Major, and distance learning experienced students have more confidence on their online skills but may need more help in fully utilizing online resources. Such a difference in facilitation preference between student characteristics deserves further study to provide more explanation.

With respect to grades, this study found that low GPA students did not even request any facilitation. The possible explanation is that low GPA students may not have enough motivation to learn.

Overall, the implication of the above findings is that, from students' viewpoints, assignments, grades, and network access should be the central foci of web-based courses. Expectations of assignments, grading criteria, and the guidelines of course site access should be well stated in course sites and thoroughly communicated with students by the instructor.

Learning Achievement and Online Facilitation

The result showed that among experienced, female, older, Open Distance Learning major, and high GPA students, medium-grade students requested more facilitation than either low or high-grade students. It implies that if low-grade students had requested sufficient facilitation, they may achieve better grades. High-grade students may already have the ability to learn by themselves without much facilitation.

The result also showed that among other majors and medium GPA students, low-grade students requested more facilitation than either medium or high-grade students. This finding indicates that other majors and medium GPA students have experienced learning difficulties in the course. It not only suggests that web-based instructors should provide more facilitation to other majors and medium GPA students, but also propose a further research question – what kind of difficulties that other majors and medium GPA student may have experienced and how to assist them for better learning experiences.

In addition, the result showed that among male and younger students, high-grade students requested more facilitation than either low or medium-grade students. High-grade students may have stronger motivation to solve problems and concern more about learning achievement so they asked for more facilitation than low or medium-grade students do.

Conclusion

This study identifies five types of online facilitation requested by students. Among them, the two most requested types of online facilitation are 1) assignments and grades 2) network access. This study also makes suggestions for web-based course design and teaching. The following summarizes these suggestions:

1. Make due dates of assignments and activities flexible and explicitly clear
2. Thoroughly communicate with students about the expectations of assignments and grading criteria
3. Seek immediate supports from system support team to solve problems in the event that network access problems occur
4. Design instructional strategies emphasizing peer interaction in web-based courses and encourage peer interactions in teaching web-based courses
5. Employ learner motivational strategies in order to encourage low GPA students and non-experienced students to request facilitation online

The major limitation of this study is the small size of the research sample. There are 29 students participated in this study. With such a small number of participants and 3 to 5 categories in each variable to be analyzed, it is very difficult to employ statistical tests that will show meaningful results. Therefore, the findings from this study should be considered as tentative, and generalization from the conclusions of this study should be very limited.

A repetition of this study with larger sample size is recommended. With a large number of participants, sufficient data can be collected for statistical analysis in order to generalize meaningful conclusions.

More variables should also be incorporated to develop the concept of facilitation and better understand the nature of facilitation. It is still unclear that lack of online skills needs more facilitation or is just not able to post

request for facilitation. It is also uncertain about the relationship between computer anxiety and request for facilitation.

Overall, this study identifies five types of online facilitation that students requested. Further research may be conducted to further verify these five types of online facilitation and to explore their relationships with learner characteristics and learning achievement.

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